The Role of Small and Large Businesses in Economic Development

By Kelly Edmiston

Increasingly, economic development experts are abandoning traditional approaches to economic development that rely on recruiting large enterprises with tax breaks, financial incentives, and other inducements. Instead, they are relying on building businesses from the ground up and supporting the growth of existing enterprises. This approach has two complementary features. The first is to develop and support entrepreneurs and small businesses. The second is to expand and improve infrastructure and to develop or recruit a highly skilled and educated workforce. Both efforts depend in large part on improving the quality of life in the community and creating an attractive business climate.

The reason for the shift in approaches is clear. Experience suggests that economic development strategies aimed at attracting large firms are unlikely to be successful—or successful only at great cost. Smokestack chasing can be especially costly if it generates competition for firms among jurisdictions. Further, because of the purported job creation role and innovative prowess of entrepreneurs and small businesses, creating an environment conducive to many small businesses may produce more jobs than trying to lure one or two large enterprises. The hope is not

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only that new businesses will create jobs in the local community, but, through innovation, some new businesses may grow into rapid-growth "gazelle" firms, which may spawn perhaps hundreds of jobs and become industry leaders of tomorrow.

This article evaluates this shift in economic development strategies. The first section describes traditional economic development strategies. The second section explores the role that small businesses play in creating jobs. The third section compares job quality between small firms and larger firms. The fourth section examines how important small businesses are in the development of new products and new markets.

The overarching question is whether promoting entrepreneurship and small businesses makes sense as an economic development strategy. This article concludes that it probably does but with some caveats. Small businesses are potent job creators, but so are large businesses. The attribution of the bulk of net job creation to small businesses arises largely from relatively large job losses at large firms, not to especially robust job creation by small firms. More importantly, data show that, on average, large businesses offer better jobs than small businesses, in terms of both compensation and stability. Further, there is little convincing evidence to suggest that small businesses have an edge over larger businesses in innovation. More research is needed to properly evaluate the case for a small business strategy, and, indeed, to determine whether or not public engagement in economic development itself is a cost-effective and worthwhile pursuit.

I. ISSUES WITH TRADITIONAL ECONOMIC DEVELOPMENT POLICIES

On the surface, one might think that a large firm would spur local economic growth by yielding significant gains in employment and personal income. The direct effect—the jobs and income generated directly by the firm—would certainly suggest this to be the case. In reality, however, it is often the effects on other firms in the area—the *indirect* effects—that carry the greatest weight in the net economic impact. Experience suggests that because of these typically large indirect effects

and the costs of incentives and competition, economic development strategies aimed at attracting large firms are unlikely to be successful or are likely to succeed only at great cost.

A recent study of new-firm locations and expansions in Georgia suggests that, on net, the location of a new large (300+ employees) firm often retards the growth of the existing enterprises or discourages the establishment of enterprises that would otherwise have located there (Edmiston). Specifically, the location of a new plant with 1,000 workers, on average, adds a net of only 285 workers over a five-year period. That is, the average firm would add 1,000 workers in its own plant but would also drive away 715 other jobs that would have been generated (or retained) if the new large firm had chosen not to locate there. Another recent study suggests that the net employment impact of large-firm locations may actually be closer to zero (Fox and Murray).

Much has been made of the indirect effects, or spillovers, of new large firms. The positive spillovers include links with suppliers, increased consumer spending, the transfer of knowledge from one firm to another, and the sharing of pools of workers. But negative spillovers are important as well. They include constraints on the supply of labor and other inputs, upward pressure on wages and rents, congestion of infrastructure, and (if fiscal incentives are provided to the locating firm) budget pressures from increased spending without commensurate increases in public revenues. Even perceptions of these negative effects can drive away firms, whether or not they actually materialize. The evidence suggests that the negative effects dominate with many large-firm locations (Edmiston; Fox and Murray).

Expansions of existing firms, however, tend to have multiplicative positive employment impacts. On average, a plant expansion adding 1,000 employees is expected to generate a net employment impact of 2,000. This result supports the notion that internal business generation and growth has potentially better prospects as a strategy than firm recruitment.

The costs per job of incentive packages are generally measured in terms of gross new jobs at the new firm. The dollars of incentives are divided by the number of jobs. During the recruitment stage, these costs are often substantially underestimated. For example, the cost per job

created for an enterprise creating 1,000 new jobs and offered $20 million in incentives is $20,000. But if the net job impact is only 285, the true cost per job created soars to $70,175.

In many cases, states or local communities could arguably receive greater returns by investing the same resources in creating a more conducive business environment for existing firms—both large and small. Thus, recruiting large firms is often costly, in both direct expenditures and the lost opportunities for other forms of economic development.

Recruitment of large firms is also costly because it may engender a competitive economic development landscape. For example, decisions by local governments to use tax abatements to lure firms are highly dependent on the decisions of their neighbors (Edmiston and Turnbull). The likelihood that a county uses tax abatements to lure firms increases 41 percentage points if its neighbors use them. In other words, a county that has a 20 percent probability of using tax abatements when none of its neighbors use them would have a 61 percent probability when all of its neighbors use them. The presence of a border with a neighboring state may also encourage the use of tax abatements.

This type of competition can be very costly. Recruiting a firm will generate costs for infrastructure, such as roads, sewers, and public services. If a community gets into a bidding war with another community, fewer resources will be available for absorbing these costs, and neither community gains an advantage by aggressive recruiting. If, for example, one community offers tax incentives to win the new firm, it will face increased costs but no property taxes to offset them. The recruitment of firms can therefore be a losing proposition for all involved.

Perhaps most important, from the perspective of society at large, aggressive courting of large firms can distort rational behavior, causing a waste of economic resources. For example, one region may offer a lower cost option for a newly locating enterprise because of a larger supply of labor, cheaper costs of transport to market, or other natural advantages. If another region is able to capture the firm away from its optimal location by offering lucrative financial incentives, resources will be expended needlessly. For example, shipping the final product over longer distances will be more expensive. While welfare in the winning region may improve (but not necessarily), welfare for the larger community encompassing the region will suffer: Fewer resources would be available for production than would be the case if the firm chose its economically optimal location.

II. SMALL BUSINESSES AND JOB CREATION

An alternative to recruiting large firms with tax incentives and other inducements is to focus on the small business sector. Perhaps the greatest generator of interest in entrepreneurship and small business is the widely held belief that small businesses in the United States create most new jobs. The evidence suggests that small businesses indeed create a substantial majority of net new jobs in an average year. But the widely reported figures on net job growth obscure the important dynamics of job creation and destruction. Nevertheless, small businesses remain a significant source of new jobs in the United States.

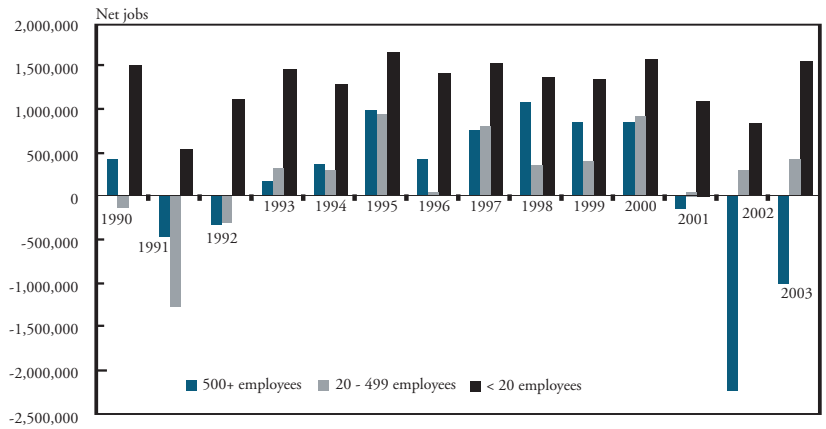
Net job creation

Data published by the U.S. Census Bureau clearly show that the bulk of net new jobs are generated by firms with less than 20 employees (Chart 1). *Net* new jobs are the total of new jobs created by firm startups and expansions (gross job creation) minus the total number of jobs destroyed by firm closures and contractions (gross job destruction). From 1990 to 2003, small firms (less than 20 employees) accounted for 79.5 percent of the net new jobs, despite employing less than 18.4 percent of all jobs in 2003.[1] Midsize firms (20 to 499 employees) accounted for 13.2 percent of the net new jobs, while large firms (500 or more employees) accounted for 7.3 percent.[2]

At first glance, the net new job figures are difficult to reconcile with the fact that, over the same period, small firms' share of total employment actually fell. In 1990, small firms employed 20.2 percent of all workers, while large firms employed 46.3 percent. In 2003, the numbers for small firms dropped to 18.4 percent but climbed to 49.3 percent for large firms.

The explanation lies in the migration of firms across size classes from year to year. In any given year, some small firms will grow beyond 20 workers and join a larger size class. Such migration trims the share of firms in the smallest class size, in the same way that small business failures trim the class size.[3] Likewise, some large firms will contract, falling below the 500-employee level and dropping into a smaller size class. Also, new small businesses are born, increasing the share of jobs in the

Chart 1
NET JOB CREATION BY FIRM SIZE, 1990-2003



Source: U.S. Census Bureau Statistics of U.S. Business

small-firm class. The data, thus, suggest that the effects of migration of small firms into larger size classes and small business failures outweigh the effects of the migration of large firms into smaller size classes and small business startups. Migration also makes it difficult to attribute job growth to firm size.[4]

Gross job flows

While striking, the net job growth figures presented above can also be somewhat deceiving. Gross job flows are considerably larger than net job flows. Roughly 23 million net new jobs were created from 1990 to 2003, but these figures represent the difference between 239 million gross new jobs created and 216 million gross jobs lost. Clearly, net employment figures mask a great deal of volatility in the labor market.

The relatively high share of net new jobs created by small businesses stems mainly from relatively large gross job losses among larger firms—not from massive job creation by small firms. From 1990 to 2003, small firms created almost 80 percent of *net* new jobs but less than 30 percent of *gross* jobs (Table 1).[5] Small firms also accounted for about 24 percent of gross job losses. Large firms created almost 40 percent of gross new jobs but suffered 43.5 percent of gross job losses.

Table 1

JOB CREATION AND DESTRUCTION BY FIRM SIZE CLASS, 1990-2001

Employment Size Class	Share of Total Employment (2003)	Share of Gross Job Creation (1990-2003)	Share of Gross Job Destruction (1990-2003)	Share of Net New Jobs Created (1990-2003)
<20	18.4	29.3	23.9	79.5
20-499	32.3	30.7	32.6	13.2
500+	49.3	39.9	43.5	7.3

Source: U.S. Census Bureau, Statistics of U.S. Businesses.

Most gross and net new jobs at small businesses stem from existing business expansions rather than from new business startups. Small business startups created about 36 percent of gross new jobs from 1990 to 2004, an average of roughly 1.8 million jobs per year. At the same time, the death of small firms was responsible for an average loss of more than 1.6 million gross jobs each year. Thus, the net job growth from small business startups in the 1990s and early 2000s (new jobs created minus job losses) was relatively small, representing less than 13 percent of total net job growth among the smallest firms.

Self-employment

In the United States, 75 percent of business establishments represent the self-employed and, therefore, have no payroll at all. Some of the self-employed have other jobs as well, but for many, self-employment is their primary source of income. Clearly, many entrepreneurs start their businesses as self-employed people. They acquire new employees as their businesses expand.

Mainly because these establishments generate only about 3 percent of total receipts (sales) annually, data for the sector are generally less available than for the employer sector. But the Census Bureau annually collects limited information from business tax returns filed with the Internal Revenue Service. In 2004, more than 19.5 million individuals were self-employed or operated businesses with no payroll. This number is roughly 12 percent of the working population and about 26 percent higher than

in 1997. The number also corresponds to a compound annual growth rate of about 3.4 percent over the period. By contrast, total private employment over the same period increased 0.8 percent annually.[6]

III. JOB QUALITY AT SMALL BUSINESSES

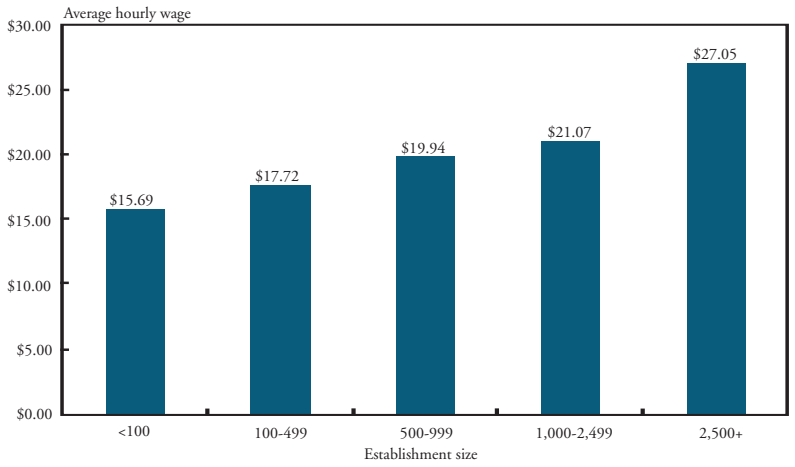
Knowing that small businesses create a significant share of new jobs, it is natural to ask how these jobs compare to those at larger firms. Simply put, large firms offer better jobs and higher wages than small firms. Benefits appear to be better at large firms as well, for everything from health insurance and retirement to paid holidays and vacations. Finally, job turnover, initiated by both employers and employees, is lower at large firms. The lower rates of employee-initiated turnover suggest that job satisfaction and mobility are relatively greater at larger firms. Lower rates of employer-initiated separations suggest that jobs at larger firms are more stable.

Earnings

Large firms pay higher wages than small firms. In 2005, the average hourly wage in establishments with less than 100 workers was $15.69 and increased consistently with establishment size. Wages increased to $27.05 (a 72 percent premium) for establishments with 2,500 or more workers (Chart 2). Smaller businesses are also much more likely to employ low-wage workers. In 2004, establishments with less than 100 workers paid nearly a fourth of their workers less than $8 per hour. Establishments with 2,500 or more workers paid only 3 percent of their workers less than $8 per hour (Bureau of Labor Statistics 2004). Again, the percentage of workers earning low wages declines consistently as establishment size increases. The gap does not appear to be narrowing, as research finds wage growth at large firms equals or exceeds that at small firms (Hu).[7]

There are several explanations for the general wage discrepancies across workers or classes of workers. Workers doing the same job might be willing to accept a lower wage for increased job stability, better fringe benefits, or other positive job attributes. In fact, research has found that many workers accept lower wages in exchange for health benefits

Chart 2
AVERAGE HOURLY WAGE, BY ESTABLISHMENT SIZE, 2005



Source: Bureau of Labor Statistics, U.S. Department of Labor (2007). *National Compensation Survey: Occupational Wages in the United States, June 2005*

(Olson). But this is not a plausible explanation for the size-wage effect because large firms tend to offer more stable employment and better benefits than small firms.

Large firms often have undesirable working conditions, such as weaker autonomy, stricter rules and regulations, less flexible scheduling, and a more impersonal working environment. But, to the extent that empirical evidence can capture these differences, working conditions cannot explain the firm size-wage effect (Brown and Medoff).

Demographics may offer a plausible explanation: Women and minorities typically earn less than their white male counterparts. But evidence shows that, with the exception of Hispanics, women and minorities are generally more likely to work for larger firms. Blacks make up about 10 percent of smaller firms (less than 500), compared to 13 percent of larger firms (Headd).[8] Similarly, women make up 45 percent of smaller firms but 48 percent of larger firms. This pattern holds for higher paying jobs as well. Professional women are disproportionately employed by large establishments (Mitra). The same is true for minorities in science and engineering fields (National Science Foundation). Only Hispanics show a contrary trend, making up 12 percent of smaller firms but only 9 percent of larger firms.

Another potential explanation for the size-wage effect is the difference in average firm size across industries. If the industries that pay better wages generally have larger firms, part of the size-wage effect would arise from industry makeup. In reality, however, the size-wage effect persists across industries (Table 2). There are a few minor exceptions (shaded in the table), but, for the most part, the exceptions are industries that offer relatively low pay overall.

Analysts have explored many other possibilities. But even after controlling for variables such as "collar color," union status, plausibility of a union threat, and industry makeup, researchers have been unable to explain away the persistent firm size-wage effect (Brown and Medoff). The relationship persists even for piece-rate workers and for workers moving across different-sized employers. In 1989, Brown and Medoff finally concluded: "Our bottom line is that the size-wage differential appears to be both sizable and omnipresent; our analysis leaves us uncomfortably unable to explain it, or at least the part of it that is not explained by observable indicators of labor quality."

Other theories to explain the size-wage effect have surfaced since the Brown and Medoff study, some of which have empirical support. Among these are theories suggesting that larger employers may make greater use of high-quality workers. This might occur, for example, because larger firms are more capital-intensive and require higher skilled employees to operate the plant and equipment. Empirical data seem to bear this out, as 25.5 percent of workers at larger firms in 1998 had a bachelor's degree or higher, compared to 20.3 percent at smaller firms (Headd). Further, some argue that workers at large firms have a greater incentive to gain additional education and new skills because of greater opportunities for upward mobility (Zabojnik and Bernhardt). Others suggest that because employee monitoring is more costly at larger firms, these firms pay higher wages to deter shirking on the job—but this explanation is not supported by the data (Oi and Idson). Another possibility is simply that the larger scale of larger firms in some industries means lower costs (Pull; Idson and Oi). Or perhaps less stable employees, who are likely to have lower wages, are attracted to small firms (Evans and Leighton; Mayo and Murray).

Table 2

SALARY DATA BY INDUSTRY AND FIRM SIZE

Industry	Ann. Salary Small Firms ($) [2]	Ann. Salary Medium Firms ($) [3]	Ann. Salary Large Firms ($) [4]	Ratio (%) [4]/[2]
Forestry, Fishing, Hunting, and Agriculture Support	26,324	NA	NA	NA
Mining	41,234	51,712	63,046	152.9
Utilities	30,644	NA	NA	NA
Construction	32,456	42,087	50,690	156.2
Manufacturing	30,933	37,563	47,835	154.6
Wholesale Trade	39,845	44,882	58,058	145.7
Retail Trade	20,058	27,998	19,486	97.1
Transportation and Warehousing	27,772	32,307	39,101	140.8
Information	40,728	52,292	60,308	148.1
Finance and Insurance	45,001	59,279	69,971	155.5
Real Estate and Rental and Leasing	29,794	35,352	39,194	131.6
Professional, Scientific, and Technical Services	43,135	58,776	62,227	144.3
Management of Companies and Enterprises	58,360	57,612	81,530	139.7
Administrative and Support, Waste Management and Remediation Services	26,968	25,553	27,180	100.8
Educational Services	19,966	25,406	30,348	152.0
Health Care and Social Assistance	37,624	30,868	37,153	98.7
Arts, Entertainment, and Recreation	28,580	25,716	24,079	84.3
Accommodation and Food Services	11,138	12,219	15,745	141.4
Other Services (except Public Administration)	19,905	23,177	28,406	142.7
Unclassified	13,164	NA	NA	NA
ALL FIRMS	29,213	33,639	41,373	141.6

Source: Author's calculations using data from *Statistics of U.S. Businesses*, U.S. Census Bureau

Note: NA indicates that data were not available.

Many explanations for the size-wage effect have been explored with little success. Lacking a satisfying explanation, however, workers still tend to earn higher wages at large firms.

Fringe benefits

Small business owners and their employees are much less likely to have employer-based health insurance policies or health insurance policies of any kind. Survey data from the Census Bureau reveals that in 2002 about 31 percent of workers at small businesses (25 or less employees) had employer-based health insurance policies in their own name, compared to 69 percent at large businesses (1,000 or more employees) (Mills and Bhandari).[9] Of the nearly 44 million uninsured people in the United States in 2002, fully 60 percent were in families who owned or worked at small businesses.[10] Among the self-employed, about 32 percent are uninsured, compared to 18 percent of all workers.[11]

Perhaps the best source of information on fringe benefits by employer size is the National Compensation Survey conducted by the Bureau of Labor Statistics (2006). Workers at large firms are much more likely to receive retirement benefits; life insurance; and health, dental, and vision insurance (Table 3). Eligibility for both short-term and long-term disability benefits are about twice as likely at large firms than at small firms. Aggravating the discrepancy in disability benefits is the fact that very small employers generally are not required to provide employees with workers' compensation insurance.[12] The average number of paid holidays is almost 13 percent higher at large firms, and paid vacation days are roughly 20 percent to 40 percent greater at large firms, depending on length of service. The difference in paid vacation days tends to increase in both absolute and relative terms with length of service. Eligibility for nonproduction bonuses (that is, bonuses not based on sales or output) is comparable at large and small firms, but benefits generally appear to be much more generous at larger firms.

Job stability

Perhaps the best measure of job satisfaction is the propensity of employees to separate from their employers. Likewise, the likelihood of being dismissed from a job is an important factor in determining the

Table 3

FRINGE BENEFITS AVAILABILITY BY FIRM SIZE, MARCH 2006

Fringe Benefit	100+ Employees	1-99 Employees
Retirement benefits (%)		
Any type	78	44
Defined benefit	35	9
Defined contribution	70	41
Health care (%)		
Medical care	84	59
Dental care	64	31
Vision care	40	20
Outpatient prescription drug coverage	80	56
Insurance (%)		
Life Insurance	69	36
Short-term disability benefits	53	27
Long-term disability benefits	43	19
Paid vacation days (#)		
After 1 year of service	10.1	7.8
After 5 years of service	15.0	12.3
After 25 years of service	22.3	16.3
Paid holidays (#)	9	8
Nonproduction bonus (% eligible)	49	44

Source: U.S. Department of Labor, Bureau of Labor Statistics, *National Compensation Survey: Employee Benefits in Private Industry in the United States, March 2006*

quality of jobs. Turnover in general, that is, both employer-and employee-initiated separations, is therefore indicative of lower quality jobs—due to job instability in the former case and (relative) job dissatisfaction in the latter.

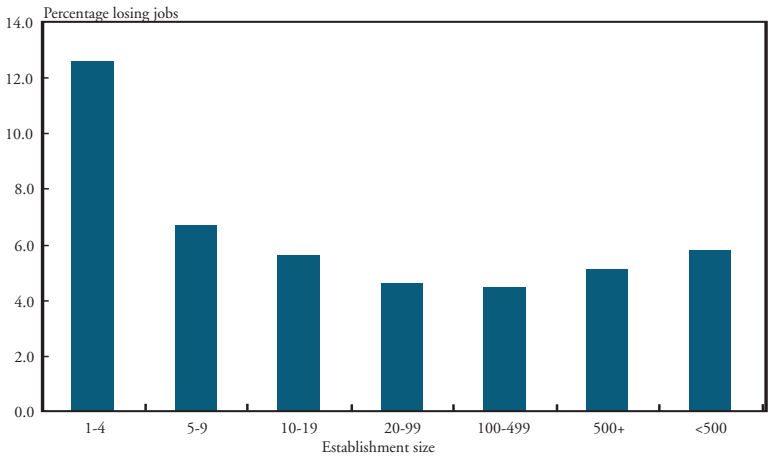
Tabulations show a consistent downward trend in annual rates of permanent job separations as firm size increases (Anderson and Meyer). Permanent separation rates were close to 22 percent for firms with less than 100 employees, 13 percent for firms with 500-1,999 employees, and only 8 percent for firms with 2,000 or more employees. Temporary separations, which are about 28 percent of all turnover, occurred at roughly equal rates at small and large firms. The authors back up their tabulations with more sophisticated statistical analyses that show a significant negative relationship between job dissolution and firm size (Groothuis). While these separations include both employer- and employee-initiated separations, other research

shows a significant negative relationship between firm size and probability of layoff (Winter-Ember; Campbell). Similarly, quit rates decline with firm size (Brown and Medoff).

A natural reason for lower quit rates at large firms is the higher average wage and better fringe benefits at large firms, which would be expected to reduce employee decisions to separate. This is especially true for pensions, which reward long tenure specifically. As shown in Table 3, retirement benefits are available to 78 percent of large-firm workers but only 44 percent of small-firm workers. The presence of labor unions, which are much more common at large firms, may indirectly reduce turnover through the higher wages generally paid to unionized workers, but unions may also directly reduce turnover by giving dissatisfied workers a "voice" in their employment situation, offering an alternative to leaving (Anderson and Meyer). Further, larger firms offer more on-the-job training and more advancement opportunities, which makes it easier for them to maintain long employment relationships with their workers (Idson). Finally, some argue that the size-layoff relationship may be a spurious relationship resulting from the tendency of smaller businesses to attract less stable and capable workers, which also would work to explain part of the size-wage relationship (Winter-Ember).

A critical factor in greater labor turnover at smaller businesses is that the failure rate of small businesses is somewhat greater than that of larger businesses, which leads to higher rates of employer-initiated separations (Dunne and others; Idson). Failure rates of establishments drop markedly as firm size increases to 100 employees, but then turn upward again such that firms with 500 or more employees have larger failure rates than firms with 20-99 employees. Nevertheless, the failure rates for the smallest firms (one to four employees) generally are about one and one-half times higher than those of the largest firms. More important for this analysis is the loss of jobs from business failures. As seen in Chart 3, approximately 12.6 percent of all workers in the smallest firms (one to four employees) lost their jobs from business failures in 2002-03, compared to 5.1 percent at the largest firms (500 or more employees).

Chart 3
JOB LOSSES FROM BUSINESS FAILURES, 2002-2003



Source: *Statistics of U.S. Businesses*, U.S. Census Bureau

IV. SMALL BUSINESS AND INNOVATION

Joseph Schumpeter, the renowned analyst and advocate of capitalism, asserted that the hallmark of capitalism is innovation: "The sweeping out of old products, old enterprises, and old organizational forms by new ones." He referred to this process as "creative destruction." In capitalism, therefore, the only survivors are those who constantly innovate and develop new products and processes to replace the old ones.

Small businesses are largely thought to be more innovative than larger firms for three reasons: a lack of entrenched bureaucracy, more competitive markets, and stronger incentives (such as personal rewards). Small businesses are indeed crucial innovators in today's economy and are the technological leaders of many industries. But the conventional wisdom—that small businesses are the cornerstone of innovative activity and that large firms are too big and bureaucratic to make significant innovations—is false. Both small and large firms make significant innovations, and both types of firms are critical to the success of today's economy.

Schumpeter asserted that larger firms are better positioned to make innovations, especially if operating in a concentrated market (such as a monopoly or a market in which only a few firms dominate). Several concepts underlie his reasoning (Vossen; Symeonidis).

Research and development (R&D) expenditures involve very large fixed (sunk) costs. R&D costs can be recovered only with a large sales volume, so that the costs can be spread over a large number of items. Further, larger firms generally have better access to external financing, and monopolistic firms, which tend to be larger, have better access to internal financing because of their generally higher profitability. Larger firms also have a greater capacity to undertake several R&D projects at once and, hence, dilute the risk of any one project in a diversified portfolio.

There are several other advantages to innovation at large firms beyond financing and managing R&D. Large firms tend to have established reputations and name recognition, which make it easier to enter new markets and/or established marketing channels. Thus, larger firms are often better able to take advantage of innovations through production and sale. In addition, having a large number of colleagues, which is more likely at a large firm, facilitates a division of labor and the solution of problems (for example, by seeking the assistance of colleagues) and increases the likelihood that "serendipitous discoveries [are] recognized as important" (Vossen). Finally, many of the largest firms operate in industries in which only a few firms operate or dominate the market. For the most part, these firms do not compete with one another on the basis of price, but rather on the basis of quality and product differentiation. Given this market structure, large firms may, therefore, have greater incentive to innovate.

While large-firm strengths are mostly material in nature, small-firm strengths are mostly behavioral (Vossen). Perhaps the most critical strength is the lack of an entrenched bureaucracy that often characterizes larger firms. An entrenched bureaucracy can lead to long chains of command and subsequent communication inefficiency, inflexibility, and loss of managerial coordination. Further, small firms, to the extent that they operate in more competitive environments, may have a greater incentive to innovate so as to stay ahead of rivals. Finally, because ownership and management are more likely to be intertwined at smaller

firms, the personal rewards of potential innovators are higher. As a related factor, smaller firms may be better able to structure contracts to reward performance (Zenger).

Given the relative strengths of large and small firms, whether small businesses are more innovative is an empirical question. Numerous studies have presented results on the relationship between firm size and R&D or innovative activity using a myriad of measures (Symeonidis). Unfortunately, the results are mixed.

The large majority of small firms (especially those with less than 100 employees) do not engage in formal R&D, and the degree to which they engage in informal R&D is difficult to gauge (Symeonidis). Total R&D increases with firm size, but studies have offered differing views on the intensity of R&D. Intensity is generally measured across firm size classes as R&D expenditure per employee or relative to sales. The preponderance of the evidence suggests two tendencies. First, R&D intensity increases with firm size in some industries and decreases in others, as do R&D outcomes, such as patents (Scherer; Acs and Audretsch; Pavitt and others). Thus, a general statement about the relationship between R&D and firm size probably is not sensible. Second, to the extent that a generalization can be made, the relationship is likely a moderate U-shape, meaning that both smaller firms (above a threshold size) and very large firms engage in R&D more intensively than medium-sized firms (Gellam Research Associates; Bound and others; Pavitt and others).

More clear is that smaller businesses are more efficient at innovation, which means they produce more innovations for a given amount of R&D than do larger firms (Vossen). Thus, they often create more innovation value per given amount of R&D. Part of this may be due simply to underestimation of R&D expenditure at smaller firms, but others suggest that small firms are more effective in taking advantage of knowledge spillovers from other firms (Acs and others).

Perhaps the industry with the greatest history of innovations by lone entrepreneurs and small businesses is the computer industry.[13] The consensus first personal computer, the MITS' Altair (1975), and the first personal computer as we know them today, the Apple II, were developed and marketed by what were, at the time, very small businesses.[14] The first software written specifically for the personal computer

(BASIC) was developed and marketed by Paul Allen and Bill Gates as part of a small business, Traf-O-Data, which would later evolve into Microsoft (1975).

The PC era arguably would have been substantially delayed if not for entrepreneurs starting small businesses. The large computer companies seemed to have little initial interest in personal computers. Hewlett-Packard, for example, rejected as nonviable the first Apple computer when it was developed by employee Steve Wozniak in 1976. It was the rapid sales of the Apple II that spawned development of IBM's PC, which was not introduced until 1981. Xerox rejected a proposal in 1971 to design a "portable" computer and rejected multiple proposals in 1976 to market its personal computer, Alto, which was designed in the early 1970s for research use.

Clearly, many of the great innovations in this industry were made by lone entrepreneurs and small businesses. Nevertheless, the innovations were made possible by years of R&D by large firms like AT&T and IBM and their precursory innovations (like the transistor). Many of the enhancements in personal computing since then have come from large firms as well, including the hard drive (IBM PC/XT), although enhancements in personal computing, software, and their marketing continue to be made by both small and large firms.

The message seems to be that both small firms and large firms make significant innovations that keep the economy moving and growing, although small firms may be more efficient at innovation. Small firms are the great innovators in some industries, while large firms are the great innovators in others. Moreover, small and large businesses interact in innovative activity. The computer industry was largely developed by large firms (AT&T and IBM), small firms advanced computing through the development of personal computers (MITS and Apple), large firms brought the innovation to the public at large through mass marketing (the IBM PC), and both small and large firms continue to improve computing today with additional innovations and enhancements.

Often entrepreneurs leave large enterprises to start small firms, either because innovation was hampered in their existing enterprise or because the entrepreneurs wanted to ensure the rewards for themselves. And many small firms grow rapidly to become the largest of the large firms. Further, innovative small businesses often benefit enormously from the basic R&D of large firms.

V. CONCLUSION

This analysis evaluated the economic development role of small businesses vis-à-vis large businesses. It suggests that small businesses may not be quite the fountainhead of job creation they are purported to be, especially when it comes to high-paying jobs that are stable and offer good benefits. Big-firm jobs are typically better jobs. Moreover, while small businesses are important innovators in today's economy, so are large businesses. There is no clear evidence that small businesses are more effective innovators. Further, the innovations of both small businesses and large businesses are inextricably linked. Still, small firms create the majority of net new jobs and are critical innovators, and efforts to encourage the formation and growth of small enterprises are probably sensible in most cases.

While large firms offer better jobs on average and contribute significantly to job creation and innovation, research and experience suggest that attempts to recruit large enterprises to a specific community are unlikely to be successful (because of competition from competing communities). And they are not likely to be cost-effective even if they are successful. More generally, an economic development strategy that focuses on a particular business or industry is very risky because sorting prospective winners and losers is difficult at best.

Where do these facts leave economic development strategy? As noted earlier, net employment impacts from firm expansions tend to be much greater than those associated with new-firm locations. This suggests that concentrating on organic growth, or the growth of existing or "home-grown" businesses, is likely to be a much more successful strategy than the recruitment of new firms. Given the role of small businesses in employment growth, supporting entrepreneurs and budding businesses is also likely to be an effective strategy. The hope is that some of these small businesses can grow to become the large firms of tomorrow and offer the kinds of benefits that typically come with employment in a large firm.

The key to a successful strategy is to get the policies right. Evidence increasingly suggests that the right approach is usually to focus on developing an attractive and supportive environment that might enable any business, whether small or large, to flourish, and to allow the market to sort out which businesses succeed. Many communities have had success

in creating this environment. They have developed and fostered a high-quality workforce through great schools, community colleges, and universities. They have provided life-long learning opportunities; built and maintained high-quality public infrastructure; created a business climate with reasonable levels of taxation and regulation; and, through good government and quality amenities, have created the kinds of communities where highly educated and skilled people want to live and work.

APPENDIX

FIRM MIGRATION, CLASSIFICATION, AND GROWTH

The migration of firms into and out of size categories also makes attributing job growth to size categories difficult (Okolie). The job figures presented in Chart 1 classify firms into size classes based on their size at the beginning of the period, which favors a finding of higher growth among small firms, rather than at the end of the period. Table A1 decomposes job growth from the second quarter of 2000 into job classes using beginning size of firm, mean size of firm over the period, and end size of firm. If the beginning size of the firm is used to classify firms, small firms with less than 20 employees are responsible for 53.2 percent of net job growth in the quarter, whereas if end-of-period size is used, small firms are responsible for only 16.2 percent of net job creation in the quarter. Again, this pattern is consistent with significant movement of small firms into larger class sizes.

Table A1

SHARE OF NET JOB GROWTH BY FIRM SIZE,
SECOND QUARTER 2000, BY SIZE CLASSIFICATION SCHEME

Employees	Beginning Size	Mean Size	End Size
<20	53.2	34.5	16.2
20-499	34.7	45.3	55.7
500+	12.1	20.2	28.1

Source: Okolie

ENDNOTES

[1]The latest date for which data were available is 2003. All charts in this article use data through the latest year in which they were available.

[2]These numbers are somewhat obscured by large job losses in 2002 and 2003, especially at large firms. Through 2001, small firms created 69.1 percent of net new jobs, compared to 10.1 percent for midsized firms and 21.2 percent for large firms.

[3]For this reason, it would be misleading to measure net employment changes as total employment in a size class at the end of the year less total employment in the size class at the beginning of the year. The numbers presented in this section were generated by the U.S. Census Bureau from longitudinal data from individual firms.

[4]The job figures presented in Chart 1 classify firms into size classes based on their size at the beginning of the period, which favors a finding of higher growth among small firms, rather than at the end of the period (Appendix).

[5]Some research suggests that the size-job creation nexus operates in reverse for manufacturing plants: Small firms create most gross jobs and suffer the most gross job losses, but larger firms contribute the most to net job creation (Davis and others).

[6]According to the Bureau of Labor Statistics, total private nonfarm employment increased from 104.6 million in 1997 to 110.7 million in 2004. Private employment grew at a much faster 2.2 percent annual rate in the prerecession period from 1997 to 2000. Recessions often find individuals moving out of traditional employment and into self-employment, which explains some of the discrepancy in growth rates.

[7]The firm size-wage effect persists across other countries as well. Similar results have been found, for example, in Canada (Morisette), Germany (Schmidt and Zimmermann), Austria (Winter-Ember), the United Kingdom (Belfield and Wei), and Switzerland (Winter-Ember and Zweimüller), among others.

[8]Kraybill and others show that the large-firm wage premium is higher for blacks than for whites.

[9]Some workers may have been covered by another family member's employer-based policy.

[10]U.S. Census Bureau, Current Population Survey, 2003 Annual Social and Economic Supplement.

[11]Some research suggests, however, that health-care utilization rates for the self-employed generally are the same as those for wage earners, despite their much lower rate of health insurance coverage (Perry and Rosen). This suggests that self-employed people may have been finding other means for financing their medical care other than health insurance.

[12]See National Academy of Social Insurance, 2003. The maximum number of workers who can be employed without coverage varies from state to state but generally is in the range of three to five workers. Texas does not mandate workers' compensation coverage.

[13]The source for much of the historical information in this section is "Chronology of Personal Computers." Accessed March 23, 2007, at *http://www.islandnet.com/~kpolsson/comphist/index.htm.*

[14]The Altair was preceded by the Scelbi and the Mark-8, both in 1974.

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